

Amendments to the Claims

Please amend the claims as follows:

14. (currently amended) A method for manufacturing a microfluidic device ~~having a first and a second plastic substrate with substantially planar apposed surfaces,~~ comprising:

providing a first and second plastic substrate each having at least one generally planar surface and formed of a similar polymeric material, wherein the planar surface of the first plastic substrate includes at least one microstructure;

apposing ~~at~~ the planar surface of the first plastic substrate to ~~at~~ the planar surface of the second plastic substrate, wherein the planar surface of the first plastic substrate includes microstructures; and

heating the planar surface of the ~~apposed~~ first and second plastic substrates above ~~its~~ their glass transition temperature for a time sufficient to allow the polymer molecules to interpenetrate the two apposed surfaces and create a morphological bond; heating the planar surface of the second plastic substrate above its glass transition temperature; and interfacing the heated planar surface of the first plastic substrate with the heated planar surface of the second plastic substrate bonding the plastic substrates and forming a leak proof enclosure of the microstructures.

15. (currently amended) The method for manufacturing a microfluidic device of claim 14, wherein said apposing interfacing includes holding the substrates together under positive pressure.

16-17 (cancelled)

18. (currently amended) The method of claim 147, wherein bonding said morphological bond includes enclosing the microstructures.

19. (currently amended) The method of claim 147, wherein bonding said morphological bonding includes forming a leak proof enclosure of the microstructures.

*b1*  
20-21 (cancelled)

22. (currently amended) The method of claim 17, wherein said at least one microstructures ~~includes~~comprises microchannels having cross sectional dimensions between about 1  $\mu\text{m}$  and 500  $\mu\text{m}$ .

23-24 (cancelled)

25. (currently amended) The method of claim 214, wherein the microstructures include two or more microchannels that are fluidly connected.

26. (cancelled)

27. (new) The method of claim 14, wherein said heating comprises heating the first and second plastic substrates to a temperature 2°-5° C above the glass transition temperature.

28. (new) The method of claim 14, wherein said heating comprises progressive heating the first and second plastic substrates.

29. (new) The method of claim 14, further comprising after said heating, reducing the temperature slowly.

30. (new) The method of claim 15, wherein said holding comprises confining the first and second plastic substrate in a mechanical fixture to apply the positive pressure.

31. (new) The method of claim 14, wherein said first and second plastic substrates are formed of polymethylmethacrylate.